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54 Demodulation of an IF-signal by a sigma-delta converter.

57 A sigma-delta signal converter is implemented using switched capacitor switching elements in which a first switch (31) serves as a mixer (11). The output of the mixer is directed to the second input of an adder (16), and its second input is the feedback signal (f1) of the sigma-delta signal converter, which is also directed into a base-frequency output signal through a decimator (14) and low-pass filtering (15).

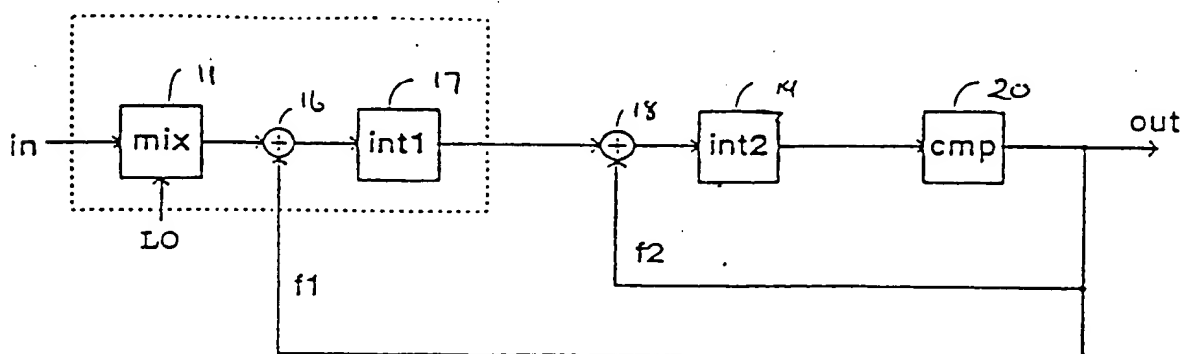


Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 6649

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	GB-A-2 233 518 (THE GENERAL ELECTRIC COMPANY PLC)	1-3,6,7,11,12	H03D7/16 H03M3/02
Y	* page 1, line 1 - page 2, line 32; figures 1,3 *	4,5,8-10,13	
Y	EP-A-0 499 827 (BLAUPUNKT-WERKE GMBH) * abstract; figures 1-3 *	4,8	
Y	IEEE JOURNAL OF SOLID-STATE CIRCUITS., vol.26, no.12, December 1991, NEW YORK US pages 1951 - 1957, XP000272856 K. LAKSHMIKUMAR ET AL. 'A BASEBAND CODEC FOR DIGITAL CELLULAR TELEPHONY' * page 1952, column 1, line 9 - column 2, line 6; figures 1,3 *	5,9,10,13	
X	SIGNAL PROCESSING. EUROPEAN JOURNAL DEVOTED TO THE METHODS AND APPLICATIONS OF SIGNAL PROCESSING, vol.22, no.2, February 1991, AMSTERDAM NL pages 139 - 151, XP000208672 H.J. DRESSLER 'INTERPOLATIVE BANDPASS-A/D-CONVERSION' * page 140, column 2, line 6 - page 143, column 1, line 8; figures 4,5 *	1-3	TECHNICAL FIELDS SEARCHED (Int.Cl.6) H03M H03D
A	US-A-5 179 380 (S.A. WHITE) * abstract; figure 7 *	1,6	
A	WO-A-91 10283 (LICENTIA-OATENTVERWALTUNGS-GMBH) * page 2, line 5 - page 7, line 25; figures 1,4 *	1,6	
A	EP-A-0 168 220 (NEC CORPORATION) * abstract; figure 3 *	1,6	
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 14 February 1995	Examiner Dhondt, I
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 94 30 6649

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	EP-A-0 335 037 (STC PLC) * abstract; figures 1-5 *	1,6	
D,A	EP-A-0 461 720 (N.V. PHILIPS'GLOEILAMPENFABRIEKEN) * abstract; figure 1 *	1,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
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